3.5 GHz SAS Workshop

Focus Area C:
Spectrum Management and Interference Detection

Mark McHenry
Shared Spectrum Company

Important SAS Monitoring and Management Issues

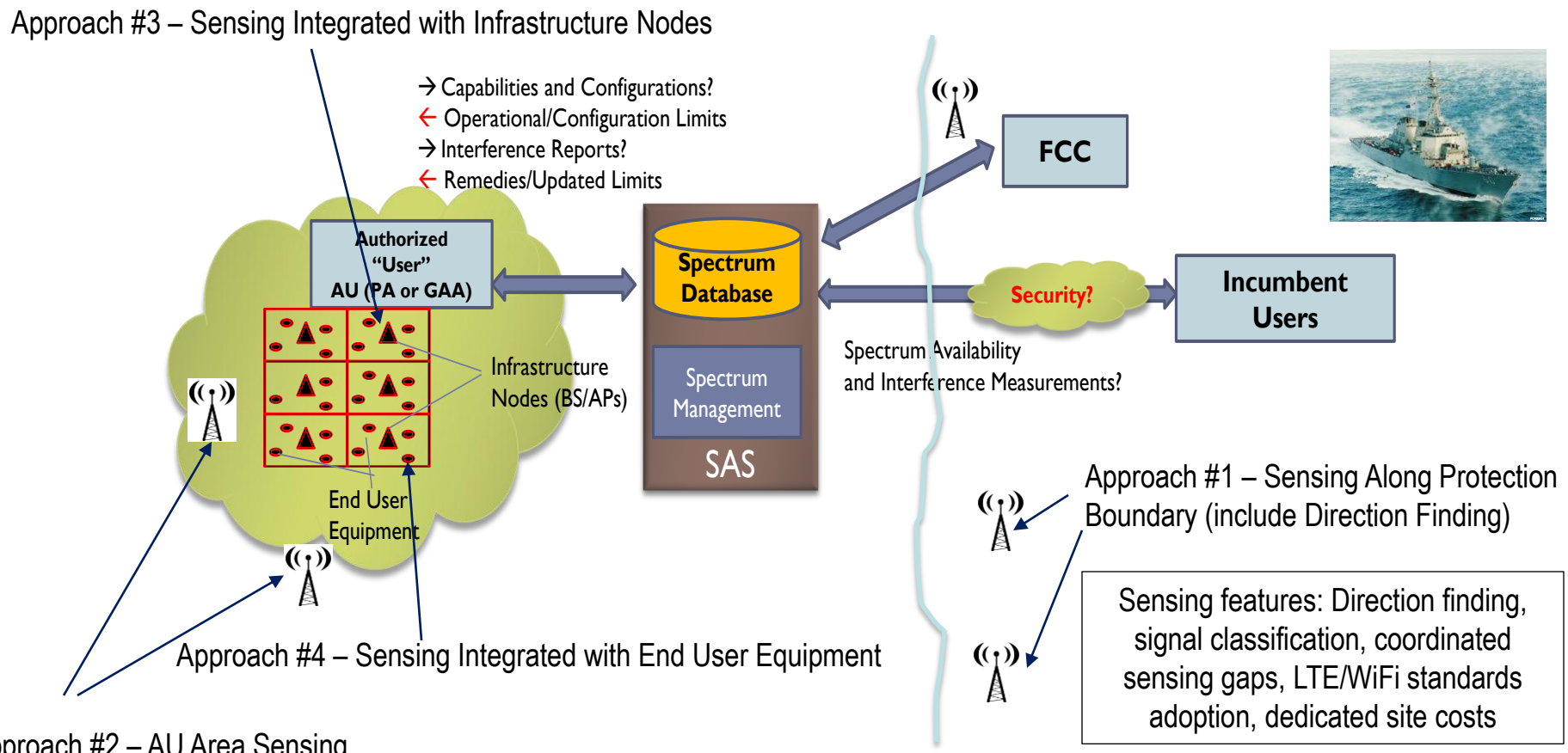
- **Spectrum sharing opportunities**: Huge separation distances because without sensing must use worse case assumptions on propagation ducting, antenna directivity, wall loss, etc
- **Mechanism to respond to incumbent's or PA interference claim:** Want to avoid turning off large numbers of AUs as part of process to resolve complaints
- **Greedy incumbent**: Incumbent will input to SAS excessive spectrum requirements. It is very difficult to validate that the request matches the need.

Combined Geo-location Database and Sensing SAS Approach

- Geo-location database only
  - Huge incumbent/AU separation distances because without sensing must use worse case assumptions on propagation ducting, antenna directivity, wall loss, etc
  - Greedy legacy users request spectrum they don't use
- Sensing only
  - AU/SAS must know receive-only legacy satellite geo-location information to avoid causing interference
  - Lack control to isolate/resolve interference complaints
  - Geographic sharing with legacy systems could be an interference problem to the legacy system without geo-location information (SAS provide potential legacy waveform type information to AUs as needed)

Combined Geo-location Database and Sensing SAS Approach Allows Heterogeneous Users to Be Located Closer Together and Reduces Interference to Incumbent Systems

Alternate Sensing Architectures Have Different Benefits



Spectrum Sensing Conclusions

- Combined Geo-location database and sensing SAS approach allows heterogeneous users to be located closer together and reduces interference to incumbent systems
- FCC should allow flexibility in the sensing architecture
  - Allow reduced incumbent / AU separations reflected by sensing architecture performance
  - Alternate sensing approaches have different advantages
- Methods to improve sensing performance (sensitivity and false alarm)
  - Cueing - SAS provides sensing classifier nearby incumbent waveform information
  - Sensing gap - Incorporating a coordinated/configurable AU sensing temporal gap (avoids signal blockage and enables PA/GAA classification (already part of IEEE WiFi standard))
- Need to incorporate local sensing and transmitter data logging (several hours) to resolve past incumbent interference complaints
  - Expensive and difficult to run interference source ‘experiments’ with mobile incumbent platforms